June 9, 1989

FIELD DATA SUBMITTAL
PART 2, REMEDIAL INVESTIGATIVE WORK
PHASE 2A
MONTROSE SITE
TORRANCE, CALIFORNIA

VOLUME FIVE
MAY 1989
MONITOR WELL CONSTRUCTION AND SAMPLING

HARGIS+ASSOCIATES, INC.
Consultants in Hydrogeology

Tucson/Phoenix/San Diego

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INTRODUCTION

This data submittal has been prepared as part of the Part 2 Phase 2A Remedial Investigative Work conducted at and in the vicinity of the Montrose Chemical Corporation (Montrose) Site in Torrance, California. This June 1989 data submittal consists of field data collected during the installation of monitor wells MW-8 and MW-9 at the McDonnell Douglas Corporation facility north of the site, initial sampling of monitor wells MW-8 and MW-9 and the May 1989 groundwater sampling round. This is Volume 5 of field data submitted during the Part 2 Phase 2A Remedial Investigative Work. The previous volumes submitted contained field data collected during the Dominguez Channel sediment survey and sampling, the off-site soil sampling, the on-site soil sampling, and the monitor well construction and sampling. Field work was conducted in accordance with the EPA-approved May 20, 1988, Sampling Plan and Quality Assurance Project Plan (QAPP) (Hargis + Associates, 1988a and 1988b).

This volume of the Phase 2A data submittal includes lithologic logs of monitor wells, organic vapor analyzer (OVA) results, well construction data, groundwater sampling data, and a monitor well location map (Figure 5; Appendices R through T).

EXPLANATION FOR LITHOLOGIC LOGS

Soil descriptions discussed in the lithologic logs (Appendix R) were compiled based on soil obtained from the standard penetrometer split-tube sampler (SPT sampler). Blow counts for the SPT sampler were recorded per 6-inch interval penetrated. Sample recovery was recorded as the ratio of soil recovered to the total interval driven. Color was described using the

Munsell Soil Color Chart. Grain size was estimated using ASTM standards D422-63, D643-78 (American Geological Institute, 1982).

An HNU Model 101 photo-ionization detector was used for field measurement of organic vapors in the soil samples. OVA readings followed the procedures outlined in the QAPP (Hargis + Associates, 1988a). The OVA readings in equivalent parts per million (ppm) of methane are presented in the lithologic logs at the depth interval sampled. The OVA background readings were deducted from the OVA soil readings when reported soil values were less than 50 ppm.

DESCRIPTION OF DRILLING

A CME 75 hollow-stem auger rig equipped with 10-inch outside diameter by 6 1/8-inch inside diameter augers was used to construct the upper Bellflower aquitard monitor wells MW-8 and MW-9. Soil samples were collected at selected intervals with an SPT sampler for lithologic description. The SPT sampler was advanced using a 140-pound hammer falling 30 inches.

Fifteen feet of 4-inch nominal 316L stainless steel wire wrap well screen with a slot size of 0.020 inches was installed in each upper Bellflower aquitard well. Four-inch nominal schedule 40 PVC well casing was installed above the screen in each upper Bellflower aquitard well. Monterey #1C sand was used to filter pack the screened interval. The filter pack was installed to between 3.5 to 5.1 feet above the screened interval. Volclay 1/4-inch pellets were installed and hydrated to provide the bentonite seal. Approximately 1 foot of silica #60 fine sand was placed above the bentonite seal to provide a grout filter. A nine-sack sand/cement slurry was used to backfill the well annulus from the grout filter to land surface. All wells were equipped with locking lids and Christy vaults.

WELL DEVELOPMENT PROCEDURES

Monitor wells MW-8 and MW-9 were developed within forty eight hours of monitor well construction. The objective of the development was to remove water introduced during construction from the well and to remove fine-grained particles from the filter pack and the formation immediately adjacent to the well. The volume of water removed from monitor wells MW-8 and MW-9 was equivalent to or greater than the volume of water used to stabilize the boring during well construction. Monitor wells MW-8 and MW-9 were developed by bailing, swabbing, and pumping. Each well was bailed with a suction bailer to remove the sediment from the well. After bailing, the screened interval was swabbed in discrete intervals. When necessary, the suction bailer was utilized again to remove the sediment. This procedure was repeated as necessary. After bailing and swabbing, the wells were pumped until the water was clear and the volume of water purged was equivalent to or greater than the water added during construction. The static water level, discharge rate, and pumping duration were recorded (Appendix S).

PUMP SETTING PROCEDURES

Monitor wells MW-8 and MW-9 are equipped with dedicated sample pumps. These upper Bellflower aquitard wells have a low well yield. Consequently, the sample pump, QED Model T1200 bladder pump, is also used for well purging.

GROUNDWATER SAMPLING

This section contains field data collected during the May 12 and May 15 through May 20, 1989, groundwater sampling rounds at the Montrose site. Groundwater sampling was conducted in accordance with the EPA-approved

May 20, 1988, Sampling Plan and QAPP (Hargis + Associates, Inc., 1988a and 1988b).

Groundwater sampling conducted on May 12, 1989, was limited to the newly installed off-site monitor wells MW-8 and MW-9. Water levels were measured at these monitor wells only. Sampling conducted during May 15 through May 20, 1989, included all on-site and off-site monitor wells. Water levels were measured at all on-site and off-site monitor wells prior to sampling. Water levels were also measured at Del Amo hazardous waste site wells DG-1, DG-2A, DP-1, DP-2, and DP-3.

Groundwater samples, including duplicate samples, collected during the two sampling rounds were submitted to Brown and Caldwell Laboratories in Pasadena, California for pesticide, EPA Method 608/8080, and volatile organic compound (VOC), EPA Method 624/8240, analyses. Field blanks submitted to Brown and Caldwell Laboratories were analyzed for pesticides, EPA Method 608/8080, and VOCs, EPA Method 624/8240. Trip blanks, submitted to Brown and Caldwell Laboratories were analyzed for VOCs, EPA Method 624/8240. Laboratory split samples collected in the field during this sampling round were submitted to Analytical Technologies, Inc. in San Diego, California, for pesticide, EPA Method 608/8080, and VOC, EPA Method 624/8240, analyses.

Additional samples were collected May 12, 1989, from monitor wells MW-8 and MW-9 for common ion and nitrate analysis. These samples were submitted to Brown and Caldwell Laboratories for analysis. Additional samples were collected during the May 15 through May 20, 1989, sampling round from selected wells for total organic carbon (TOC), EPA Method 9060, and for total organic halides (TOX), EPA Method 9020, analyses. TOC and TOX samples were submitted to Brown and Caldwell Laboratories for analysis.

Groundwater samples from nine monitor wells with total VOCs of less than 1 ppm were collected in pre-acidified volatile organic analysis (VOA) vials. The VOA vials were prepared in the laboratory by adding two drops of

1:1 hydrochloric acid to each VOA vial. Additional groundwater samples from the nine monitor wells where total VOCs were less than 1 ppm were collected in nonacidified VOA vials. These samples were designated as nonacidified VOA duplicates.

REFERENCES CITED

American Geological Institute (AGI), 1982. AGI Data Sheets, for Geology in the Field, Laboratory, and Office, 2nd Edition; June 1982.

Hargis + Associates, Inc., 1988a. Remedial Investigative Work, Part 2, Quality Assurance Project Plan, Montrose Site, Torrance, California. Prepared for Montrose Chemical Corporation, Torrance, California; May 20, 1988.

_____, 1988b. Remedial Investigative Work, Part 2, Phase 2A Groundwater, Soil, and Sediment Sampling Plan, Montrose Site, Torrance, California. Prepared for Montrose Chemical Corporation, Torrance, California; May 20, 1988.

APPENDIX R

LITHOLOGIC LOGS FOR MONITOR WELLS

APPENDIX R

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TABLE R-1

LITHOLOGIC LOG FOR MONITOR WELL MW-8

Date: May 10, 1989
Weather: Partly cloudy, cool, variable breeze.

Drill Rig: CME 75
Sample Method: Drive Sampler

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION
Hollow auger Drive sampler 10-11.3	3/6/10; R=1.3/1.5	10.0-11.3/25	10.0-11.3 CLAYEY SILT (ML): Yellowish brown, 10YR 5/4, slightly moist, firm, moderately plastic, trace fine sand.
Hollow auger Drive sampler 20-21.5	5/10/12; R=1.5/1.5	20.0-21.5/105	20.0-21.5 SILTY SAND (SM): Olive yellow, 2.5Y 6/6, slightly moist, dense, fine- grained.
Hollow auger Drive sampler 30-31.5	8/16/19; R=1.5/1.5	30-31.5/0.2	30.0-31.5 SAND (SP): Light yellowish brown, 2.5Y 6/4, slightly moist, dense, fine-grained, some silt.
Hollow auger Drive sampler 40-41.5	15/20/21; R=1.5/1.5	40-41.5/0.6	40.0-41.5 FOSSILIFEROUS SAND (SP): Light brownish gray, 2.5Y 6/2, slightly moist, dense, fossils are angular, up to 1/4-inch in size, also cemented fossiliferous, nodules are present, sand fine grained, trace silt.
Hollow auger Drive sampler 50-51.5	13/24/27; R-1.5/1.5	50-51.5/0.6	50.0-51.5 SILTY SAND (SM): Light olive gray, 5Y 6/2, slightly moist, dense, fine-grained, some laminated orange oxide staining.

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

TABLE R-1 (continued)
LITHOLOGIC LOG FOR MONITOR WELL MW-8

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION
Hollow auger Drive sampler 60-61.5	13/20/20; R=1.5/1.5	60-61.5/0.2	60.0-61.5 CLAYEY SILT (ML): Light olive brown, 2.5Y 5/6, slightly moist, stiff, slightly plastic. At 60-60.4, SANDY SILT (ML): Light olive brown, slightly moist, dense, fine-grained. At 60.7-61, SANDY SILT (ML), same as 60-60.4.
Hollow auger Drive sampler 68-69.3	20/45/50 R=1.3/1.3	68-69.3/1.2	68.0-69.3 SAND (SP): Light gray, 10YR 7/2, slightly moist, dense, fine-grained. At 68.6-68.7, SILTY CLAY (CL): Gray, 10YR 5/1, slightly moist, very stiff, moderately plastic. At 69, silty clay bed 0.05 thick, same as 68.6-68.7.

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

TABLE R-1 (continued)
LITHOLOGIC LOG FOR MONITOR WELL MW-8

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION
Hollow auger Drive sampler 70-71.5	30/37/50 R=1.5/1.5	70-71.5/1.4	70.0-71.5 SILTY SAND (SM): Light yellowish brown, 2.5Y 6/4, wet, dense, fine- grained. At 71-71.2, interbed silty clay and silty sand, silty sand, same as 70-71.5; silty clay same as 68.6-68.7.

TOTAL DEPTH OF BOREHOLE: 85.0 Feet

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

TABLE R-2

LITHOLOGIC LOG FOR MONITOR WELL MW-9

Date: May 9, 1989
Weather: Overcast, cool, variable breeze

Drill Rig: CME 75
Sample Method: Drive Sampler

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION
Hollow auger Drive sampler, 10-11.2	4/6/12; R=1.2/1.5	10-11.2/0.0	10.0-10.5 CLAYEY SILT (ML): Dark brown, 10YR 4/3, slightly moist, stiff, plastic.
			10.5-11.2 SANDY SILT (SM): Yellowish brown, 10YR 5/4, slightly moist, stiff, moderately plastic.
Hollow auger, Drive sampler 20-21.5	8/15/20; R=1.5/1.5	20-21.5/0.2	20.0-20.7 CLAYEY SILT (ML): Light olive brown, 2.5Y 5/4, slightly moist, firm, moderately plastic.
			20.7-21.5 SILTY CLAY (CL): Olive brown, 2.5Y 4/4, slightly moist, stiff, plastic.
Hollow auger Drive sampler 30-31.2	9/18/22 R=1.2/1.5	30-31.2/0.0	30.0-31.2 SILTY SAND (SM): Light olive brown, 2.5Y 5/6, slightly moist, dense, fine-grained.
Hollow auger Drive sampler 40-41.5	20/28/16; R=1.5/1.5	40-41.5/0.0	40.0-41.5 FOSSILIFEROUS SAND (SP): Light yellowish brown, 2.5Y 6/4, slightly moist, very dense, trace silt, fine-grained sand, fossils are angular, up to 1/4-inch in size, some cemented nodules.

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

TABLE R-2 (continued)
LITHOLOGIC LOG FOR MONITOR WELL MW-9

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION
Hollow auger Drive sampler 50-51.5	8/30/26; R=1.5/1.5	50-51.5/0.0	50.0-51.5 INTERBEDDED SILTY SAND AND SILT; SILTY SAND (SM): Light olive gray, 5Y 6/2, slightly moist, dense, fine-grained. SILT (ML): Olive 5Y 5/4, slightly moist, stiff, moderately plastic.
Hollow auger Drive sampler 60-61.5	12/29/40; R=1.5/1.5	60-61.5/0.6	60.0-61.3 SILTY SAND (SM): Light olive brown, 2.5Y 5/6, slightly moist, stiff, fine-grained, some oxide staining. 61.3-61.5 SILTY SAND (SM): Gray, 2.5Y N6/0, slightly moist, stiff, fine-grained.
Hollow auger Drive sampler 68-70	12/26/40/50; R=2.0/2.0	68-70/22	68.0-69.0 INTERBEDDED SILT (ML) and SANDY SILT (SM): Light olive brown, 2.5Y 5/4, moist, stiff, slightly to moderately plastic, fine-grained sand. 69.0-69.3 SILTY SAND (SM): Same as 61.3-61.5. 69.3-70.0 SILT (ML) and SANDY SILT (SM): Same as 68.0-69.0.

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

TABLE R-2 (continued)
LITHOLOGIC LOG FOR MONITOR WELL MW-9

DRILLING/SAMPLING METHOD	BLOW COUNTS; RECOVERY[1]	OVA[2] (ft/ppm)	DEPTH INTERVAL (feet) AND DESCRIPTION	
Hollow auger Drive sampler 70-71.5	19/28/42; R=1.5/1.5	70-71.5/0.8	70-71.5	SAND (SP): Olive gray, 5Y 5/2, very moist, dense, some mica, slightly odoriferous.
			71.1-71.2	SILT (ML): Same as 68.0-69.0.

TOTAL DEPTH OF BOREHOLE: 85.0 Feet

1 Blow counts per 0.5 foot interval using a standard penetrometer split-tube sampler and a 140-pound hammer with a 30-inch drop. Recovery = length of sample in sampler/length of sampler driven or cored, measured in feet.

2 Organic vapor analyzer (OVA) readings in parts per million (ppm) of soil collected at depth indicated. OVA background readings deducted from OVA readings when reported values are below 50 ppm.

APPENDIX S

WELL CONSTRUCTION DATA

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TABLE S-1

WELL CONSTRUCTION DATA
UPPER BELLFLOWER AQUITARD MONITOR WELLS

WELL ID	DEPTH DRILLED* (feet bls)	DATE COMPLETED	4-INCH* DIAMETER PVC BLANK CASING INTERVAL (feet bls)	4-INCH* DIAMETER 316L WIRE WRAP SCREEN INTERVAL (feet bls)	SCREEN SLOT SIZE (inches)	FILTER PACK* INTERVAL (feet bls)	FILTER PACK SIZE**	BENTONITE* SEAL INTERVAL (feet bls)	GROUT FILTER* INTERVAL (feet bls)	CEMENTED* INTERVAL (feet bls)
MW-8	85	05-10-89	0-65	65-80	0.020	62-85	1C	58-62	57-58	0-57
MW-9	85	05-09-89	0-66	66-81	0.020	61-85	1C	58-61	53-58	0-53

* Dimensions reported to the nearest foot.
** Filter pack consists of Monterey sand, filter pack sizes are Lone Star Lapis Lustre size designations.

TABLE S-2

WELL DEVELOPMENT PUMPING SUMMARY

WELL ID	DEPTH TO STATIC WATER LEVEL (feet bls)	DURATION OF PUMPING (minutes)	AVERAGE DISCHARGE RATE (gpm)	ELECTRICAL CONDUCTIVITY*	pH
MW-8	71.3	150	0.6	1,350	7.89
MW-9	71.1	400	0.2	3,200	6.67

* Measured in micromhos per centimeter
gpm = Gallons per minute

TABLE S-3

PUMP SETTING SUMMARY

WELL ID	DEPTH TO BLADDER PUMP INTAKE BELOW LAND SURFACE (feet)
MW-8	78.9
MW-9	78.3

TABLE S-4

WELL HEAD ELEVATIONS

WELL ID	REFERENCE POINT ELEVATION	TOP OF VAULT ELEVATION	DATE SURVEYED
MW-1	42.83	NA	01-12-87
MW-2	48.79	NA	01-12-87
MW-3	47.41	NA	01-12-87
MW-4	46.69	NA	01-12-87
MW-5	44.95	NA	01-12-87
MW-6	45.68	46.55	01-31-89
MW-7	47.42	48.05	01-31-89
MW-8	49.09	49.70	05-17-89
MW-9	48.67	49.15	05-17-89
MW-10	43.20	44.08	01-31-89
MW-11	42.69	43.39	01-31-89
MW-12	40.17	40.82	01-31-89
MW-13	42.34	42.96	01-31-89
MW-14	43.13	43.45	01-31-89
MW-15	40.51	41.26	01-31-89
BF-1	48.28	48.57	01-31-89
BF-2	49.49	49.79	01-31-89
BF-3	48.27	NA	01-12-87
BF-4	47.67	48.08	01-31-89
BF-5	39.37	40.55	01-31-89
BF-6	41.70	42.89	01-31-89
BF-7	42.64	43.14	01-31-89
BF-8	39.72	41.07	01-31-89
BF-9	48.69	49.86	01-31-89
G-1	46.66	47.07	01-31-89
G-2	43.46	43.74	01-31-89
G-3	49.69	49.91	01-31-89
G-4	39.70	40.40	01-31-89
G-5	41.71	42.82	01-31-89
G-6	42.54	43.27	01-31-89
G-7	39.88	40.77	01-31-89
LG-1	43.24	43.53	01-31-89
LG-2	44.61	45.25	01-31-89

NA = Not available

APPENDIX T

GROUNDWATER SAMPLING MAY 1989

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TABLE T-1

STATIC WATER LEVELS, MAY 1989 GROUNDWATER SAMPLING ROUND

WELL ID	DATE	REFERENCE POINT ELEVATION (feet msl)	DEPTH TO WATER BELOW REFERENCE POINT (feet)	WATER LEVEL ELEVATION (feet msl)	METHOD OF MEASURING
MW-1	05-15-89	42.83	65.75	-22.92	Flat tape sounder
MW-2	05-15-89	48.79	71.10	-22.31	Steel tape
MW-3	05-15-89	47.41	69.07	-21.66	Flat tape sounder
MW-4	05-15-89	46.69	68.62	-21.93	Flat tape sounder
MW-5	05-15-89	44.95	67.20	-22.25	Flat tape sounder
MW-6	05-15-89	45.68	67.98	-22.30	Flat tape sounder
MW-7	05-15-89	47.42	69.38	-21.96	Flat tape sounder
MW-8	05-12-89	49.09	70.83	-21.74	Flat tape sounder
MW-8	05-15-89	49.09	70.80	-21.71	Flat tape sounder
MW-9	05-12-89	48.67	70.71	-22.04	Flat tape sounder
MW-9	05-15-89	48.67	70.58	-21.91	Flat tape sounder
MW-10	05-15-89	43.20	65.08	-21.88	Flat tape sounder
MW-11	05-15-89	42.69	65.31	-22.62	Flat tape sounder
MW-12	05-15-89	40.17	62.87	-22.70	Flat tape sounder
MW-13	05-15-89	42.34	65.32	-22.98	Flat tape sounder
MW-14	05-15-89	43.13	66.27	-23.14	Flat tape sounder
MW-15	05-15-89	40.51	63.50	-22.99	Flat tape sounder
BF-1	05-15-89	48.28	69.59	-21.31	Flat tape sounder
BF-2	05-15-89	49.49	71.05	-21.56	Flat tape sounder

msl = mean sea level

TABLE T-1 (continued)
STATIC WATER LEVELS, MAY 1989 GROUNDWATER SAMPLING ROUND

WELL ID	DATE	REFERENCE POINT ELEVATION (feet msl)	DEPTH TO WATER BELOW REFERENCE POINT (feet)	WATER LEVEL ELEVATION (feet msl)	METHOD OF MEASURING
BF-3	05-15-89	48.27	69.89	-21.62	Flat tape sounder
BF-4	05-15-89	47.67	69.44	-21.77	Flat tape sounder
BF-5	05-15-89	39.37	61.96	-22.59	Flat tape sounder
BF-6	05-15-89	41.70	64.47	-22.77	Flat tape sounder
BF-7	05-15-89	42.64	65.25	-22.61	Flat tape sounder
BF-8	05-15-89	39.72	61.86	-22.14	Flat tape sounder
BF-9	05-15-89	48.69	70.12	-21.43	Flat tape sounder
G-1	05-15-89	46.66	68.27	-21.61	Flat tape sounder
G-2	05-15-89	43.46	65.86	-22.40	Flat tape sounder
G-3	05-15-89	49.69	71.58	-21.89	Flat tape sounder
G-4	05-15-89	39.70	62.63	-22.93	Flat tape sounder
G-5	05-15-89	41.71	64.75	-23.04	Flat tape sounder
G-6	05-15-89	42.54	65.46	-22.92	Flat tape sounder
G-7	05-15-89	39.88	62.29	-22.41	Flat tape sounder
LG-1	05-15-89	43.24	65.67	-22.43	Flat tape sounder
LG-2	05-15-89	44.61	66.57	-21.96	Flat tape sounder

msl = mean sea level

TABLE T-2

SAMPLING INFORMATION, MAY 1989 GROUNDWATER SAMPLING ROUND

WELL ID	DATE	TIME SAMPLE PUMP ON	TIME OF SAMPLING	AVERAGE DISCHARGE RATE (gpm)	NUMBER OF GALLONS PER ONE CASING VOLUME	APPROXIMATE NUMBER OF GALLONS PURGED	ELECTRICAL CONDUCTIVITY (umhos/cm)	pH	TEMPERATURE °C
MW-1	05-19-89	08:46	09:30	0.4	4.7	22	7,750	6.42	23.6
MW-2+	05-20-89	10:05	-----	0.4	3.4	2	---	---	---
MW-3	05-19-89	14:49	15:32	0.5	3.4	13.5	1,175	6.84	21.5
MW-4	05-18-89	13:36	14:07	0.4	4.0	12.5	2,350	6.61	22.4
MW-5	05-19-89	16:19	16:55	0.5	3.5	12	3,500	6.52	22.8
MW-6	05-16-89	16:36	17:38	0.48	7.9	26	5,500	6.48	22.9
MW-7	05-16-89	15:22	16:03	0.5	6.4	22	4,000	6.56	22.0
MW-8	05-12-89	12:29	13:30	0.36	6.4	20	1,300	7.53	22.5
MW-8	05-15-89	15:20	16:15	0.34	6.4	25	1,200	7.49	22.2
MW-9	05-12-89	09:00	10:10	0.18	6.4	27	3,200	6.31	22.3
MW-9	05-17-89	15:50	17:25	0.22	6.2	22.5	3,250	6.56	22.4
MW-10	05-18-89	09:00	10:05	0.4	8.0	24.5	2,400	7.05	22.0
MW-11	05-18-89	07:40	09:30	0.1	7.5	24	3,200	6.79	22.4
MW-12	05-16-89	08:15	09:20	0.34	8.5	30	2,000	6.99	21.3
MW-13	05-17-89	12:16	13:20	0.4	7.5	28	2,450	6.62	21.8
MW-14	05-16-89	12:46	13:25	0.36	4.3	14	2,200	6.55	22.2
MW-15	05-17-89	08:06	09:15	0.4	8.6	29	2,650	6.81	22.2
BF-1	05-19-89	13:56	14:23	6.4	35.4	160	1,000	7.34	22.4
BF-2	05-18-89	15:10	15:36	6.1	34.7	150	850	7.17	22.9

Notes

gpm = gallons per minute
--- = In order to preserve field equipment, parameters were not measured in water with high target chemical concentrations.
\+ = Approximately 50 milliliters of dense free product was purged from bottom of well; a sample was not submitted to the lab.

TABLE T-2 (continued)
SAMPLING INFORMATION, MAY 1989 GROUNDWATER SAMPLING ROUND

WELL ID	DATE	TIME SAMPLE PUMP ON	TIME OF SAMPLING	AVERAGE DISCHARGE RATE (gpm)	NUMBER OF GALLONS PER ONE CASING VOLUME	APPROXIMATE NUMBER OF GALLONS PURGED	ELECTRICAL CONDUCTIVITY (umhos/cm)	pH	TEMPERATURE °C
BF-3	05-18-89	16:33	16:52	6.0	35.1	125	1,250	7.36	22.1
BF-4	05-18-89	17:09	17:32	6.6	34.8	195	1,000	7.39	22.8
BF-5	05-16-89	09:15	09:45	6.6	39	175	600	8.09	21.5
BF-6	05-17-89	12:25	12:52	6.0	39.3	160	1,200	7.40	21.5
BF-7	05-16-89	13:05	13:30	6.3	33.2	150	1,200	7.12	23.2
BF-8	05-17-89	09:50	10:40	7.0	41.0	300	800	7.44	21.9
BF-9	05-18-89	11:05	11:50	6.6	84.6	280	800	7.70	22.7
G-1	05-18-89	13:38	14:25	5.5	60.2	220	400	9.37	22.7
G-2	05-19-89	10:07	10:51	5.5	71.2	260	700	8.07	24.1
G-3	05-18-89	15:10	15:56	5.5	61.4	215	500	7.89	22.5
G-4	05-16-89	10:25	11:06	7.5	85.4	375	625	8.09	21.9
G-5	05-17-89	11:38	12:15	7.1	81.1	280	700	8.00	21.3
G-6	05-16-89	12:17	12:50	7.5	80.9	260	625	7.89	23.4
G-7	05-17-89	09:05	09:56	7.5	76.4	460	490	8.06	23.0
LG-1	05-19-89	08:30	10:50	1.3	93.0	300	350	8.82	24.0
LG-2	05-19-89	12:38	13:20	7.5	90.0	310	420	8.02	24.0

Notes

gpm = gallons per minute
--- = In order to preserve field equipment, parameters were not measured in water with high target chemical concentrations.
\+ = Approximately 50 milliliters of dense free product was purged from bottom of well; a sample was not submitted to the lab.

TABLE T-3

IDENTIFICATION OF FIELD DUPLICATE SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE SAMPLE LOCATION	ACTUAL SAMPLE TIME	DUPLICATE SAMPLE ID	FICTITIOUS TIME RECORDED FOR DUPLICATE
05-12-89	MW-9	10:10	MW-900	09:00
05-15-89	MW-8	16:15	MW-800	15:00
05-16-89	MW-12	09:20	MW-1200	08:00
05-17-89	MW-13	13:20	MW-1300	13:00
05-18-89	BF-9	11:50	BF-900	11:00
05-19-89	MW-1	09:30	MW-100	08:45

TABLE T-4

IDENTIFICATION OF LABORATORY SPLIT SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE LOCATION	SAMPLE TIME
05-12-89	MW-9	10:10
05-15-89	MW-8	16:15
05-16-89	MW-12	09:20
05-17-89	MW-13	13:20
05-18-89	BF-9	11:50
05-19-89	MW-1	09:30

Split samples were shipped to Analytical Technologies, Inc., San Diego, California for EPA Methods 608 and 624 analyses.

TABLE T-5

IDENTIFICATION OF FIELD BLANKS
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE ID	SAMPLE PREPARATION LOCATION	FICTITIOUS TIME RECORDED FOR FIELD BLANK	BLANK WATER SOURCE
05-12-89	WB-1	MW-9	08:15	Brown and Caldwell
05-15-89	WB-1	MW-8	16:00	Brown and Caldwell
05-16-89	WB-1	MW-12	07:00	Brown and Caldwell
05-17-89	WB-1	MW-13	12:30	Brown and Caldwell
05-18-89	WB-1	BF-9	11:15	Brown and Caldwell
05-19-89	WB-1	MW-1	09:00	Brown and Caldwell

TABLE T-6

IDENTIFICATION OF TRIP BLANKS
MAY 1989 GROUNDWATER SAMPLING ROUND

SAMPLE DATE	FICTITIOUS SAMPLE TIME	SAMPLE ID	SAMPLE PREPARED BY	DATE SAMPLE PREPARED
05-12-89	11:00	TB-1	Brown and Caldwell	05-09-89
05-15-89	14:00	TB-1	Brown and Caldwell	05-09-89
05-16-89	07:30	TB-1	Brown and Caldwell	05-15-89
05-17-89	12:00	TB-1	Brown and Caldwell	05-15-89
05-18-89	11:30	TB-1	Brown and Caldwell	05-09-89/ 05-15-89
05-19-89	09:15	TB-1	Brown and Caldwell	05-15-89

TABLE T-7

WEATHER DESCRIPTIONS
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	TIME	WELL IDS	WEATHER CONDITION
05-12-89	09:00	MW-9	Cloudy, 65°F, still.
05-12-89	12:48	MW-8	Mostly cloudy, 65°F, wind from west at 10 mph.
05-15-89	15:10	MW-8	Cloudy, 72°F, wind from west at 0-5 mph.
05-16-89	08:15	MW-12, BF-5, G-4,	Partly cloudy, 68°F, still.
05-16-89	12:08	MW-14, BF-7, G-6	Partly cloudy, 74°F, wind from east at 0-5 mph.
05-16-89	15:20	MW-7, MW-6	Clear, 70°F, wind from west 0-5 at mph.
05-17-89	08:00	MW-15, BF-8, G-7	Cloudy, 65°F, intermittent light rain, still.
05-17-89	11:40	G-5, BF-6, MW-13	Cloudy, 68°F, intermittent light rain, wind from west at 0-5 mph.
05-17-89	15:40	MW-9	Cloudy, 68°F, wind from west at 3-10 mph.
05-18-89	07:40	MW-11, MW-10, BF-9	Partly cloudy, 62°F, wind from west at 0-5 mph.
05-18-89	13:10	G-1, MW-4, G-3, BF-2, BF-4, BF-3	Partly cloudy, 76°F, wind from west at 5-15 mph.
05-19-89	08:40	LG-1, G-2, MW-1	Partly cloudy, 68°F, still.
05-19-89	12:10	LG-2, MW-3, BF-1, MW-5	Clear, 78°F, wind from west at 0-10 mph, still.
05-20-89	10:00	MW-2	Clear, 75°F, wind from west at 0-5 mph.

mph = Miles per hour

TABLE T-8

ELECTRICAL CONDUCTIVITY METER CALIBRATIONS
MAY 1989 ON-SITE GROUNDWATER SAMPLING ROUND

DATE	TIME	CALIBRATION SOLUTION CONCENTRATION[1]	CORRESPONDING EC METER READING[2]	TEMPERATURE OF SOLUTION C°
05-12-89	09:05	1,000	850	17
05-12-89	09:06	10,000	8,000	16.5
05-12-89	12:40	1,000	960	20.5
05-12-89	12:41	10,000	9,000	20.5
05-15-89	15:00	1,000	950	20
05-15-89	15:00	10,000	9,000	20
05-16-89	08:15	1,000	800	15
05-16-89	08:15	10,000	8,000	15
05-16-89	12:20	1,000	1,000	27
05-16-89	12:20	10,000	10,000	27
05-17-89	08:00	1,000	900	15
05-17-89	08:00	10,000	8,000	15
05-17-89	11:35	1,000	900	18
05-17-89	11:35	10,000	8,000	18
05-18-89	07:45	1,000	850	17
05-18-89	07:45	10,000	8,000	17
05-18-89	08:40	1,000	900	18
05-18-89	08:40	10,000	8,500	18
05-18-89	13:20	1,000	1,075	27
05-18-89	13:20	10,000	10,000	27
05-19-89	08:31	1,000	850	18
05-19-89	08:31	10,000	8,000	18
05-19-89	13:57	1,000	1,000	25
05-19-89	13:57	10,000	10,000	25

1 Yellow Springs Instrument (YSI) conductivity calibration solution at 25°C (micromhos per centimeter)
2 YSI Model 33 S-C-T meter (micromhos per centimeter)
EC = Electrical conductivity

TABLE T-9

IDENTIFICATION OF ACIDIFIED VOA SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE LOCATION	SAMPLE TIME
05-16-89	BF-5	09:45
05-16-89	G-4	11:06
05-17-89	G-7	09:56
05-18-89	MW-4	14:07
05-18-89	G-1	14:25
05-18-89	G-3	15:56
05-19-89	LG-1	10:50
05-19-89	LG-2	13:20
05-19-89	BF-1	14:23

VOA = Volatile organic analysis

TABLE T-10

IDENTIFICATION OF NONACIDIFIED VOA FIELD DUPLICATE SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE SAMPLE LOCATION	ACTUAL SAMPLE TIME	DUPLICATE SAMPLE ID	FICTICIOUS TIME RECORDED FOR DUPLICATE
05-16-89	BF-5	09:45	BF-500	09:00
05-16-89	G-4	11:06	G-400	11:00
05-17-89	G-7	09:56	G-700	10:00
05-18-89	MW-4	14:07	MW-400	14:00
05-18-89	G-1	14:25	G-100	14:30
05-18-89	G-3	15:56	G-300	16:00
05-19-89	LG-1	10:50	LG-100	10:00
05-19-89	LG-2	13:20	LG-200	13:00
05-19-89	BF-1	14:23	BF-100	17:30

VOA = Volatile organic analysis

TABLE T-11

IDENTIFICATION OF TOC/TOX SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE LOCATION	SAMPLE TIME
05-16-89	G-4	11:06
05-16-89	G-6	12:50
05-16-89	MW-14	13:25
05-16-89	BF-7	13:30
05-17-89	MW-13	13:20
05-18-89	BF-9	11:50
05-19-89	G-2	10:51
05-19-89	MW-5	16:55

TOC = Total organic carbon
TOX = Total organic halides

TABLE T-12

IDENTIFICATION OF EPA AND MCDONNELL DOUGLAS SPLIT SAMPLES
MAY 1989 GROUNDWATER SAMPLING ROUND

DATE	SAMPLE LOCATION	SAMPLE TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLES PROVIDED TO
05-12-89	MW-9	10:10	4	40-ml VOA vials	D. Turner M&E
			4	1-l amber glass	D. Turner M&E
05-12-89	MW-9	10:10	2	40-ml VOA vials	J. Topp MDC
			2	1-l amber glass	J. Topp MDC
05-12-89	MW-8	13:30	2	40-ml VOA vials	J. Topp MDC
			2	1-l amber glass	J. Topp MDC

VOA = Volatile organic analysis
ml = Milliliter
l = Liter
M&E = Metcalf and Eddy, Inc.
MDC = McDonnell Douglas Corporation

TABLE T-13

STATIC WATER LEVELS, MAY 1989, DEL AMO HAZARDOUS WASTE SITE

WELL ID	DATE	REFERENCE POINT ELEVATION (feet msl)	DEPTH TO WATER REFERENCE POINT (feet)	WATER LEVEL ELEVATION (feet msl)	METHOD OF MEASURING
DG-1	05-15-89	26.75	51.06	24.31	Flat tape sounder
DG-2A	05-15-89	34.33	58.52	24.19	Flat tape sounder
DP-1	05-15-89	32.83	63.93	31.10	Flat tape sounder
DP-2	05-15-89	35.12	57.65	22.53	Flay tape sounder
DP-3	05-15-89	29.33	53.68	24.35	Flat tape sounder